REMARKS

Claims 1 to 78 were pending in the application at the time of examination. The specification is objected to for informalities. Claims 16, 18, 35, 37, 54, 56, 73, and 75 stand rejected for obviousness type double patenting. Claims 1, 20, 39, 58, 77, and 78 stand objected to for informalities. Claims 1 to 78 stand rejected as obvious.

Applicants note that the Examiner indicated two different documents were included together as one in an IDS submittal and only one of the two documents was listed on the PTO 1449. The IDS was filed by a law firm handling this application prior to responsibility for this application being transferred to the undersigned attorney. Thus, Applicants' attorney has no personal knowledge of the basis for the mistake and does not know, for example, whether the documents were mixed before or after receipt by the USPTO. Since the 'K Virtual Machine' document was cited in the instant application, it is apparent why this document was submitted. Applicants' attorney found no citation to the other document in the instant application. The action taken by the Examiner appears appropriate under the circumstances described.

Applicants have amended the specification to remove Attorney Docket Numbers and to reflect the status of the applications cited therein. Applicants respectfully request reconsideration and withdrawal of the objections to the specification.

Claims 16, 18, 35, 37, 54, 56, 73 and 75 stand rejected for obviousness-type double patenting in view of U.S. Patent No. 7,107,581, hereinafter referred to as the '581 patent.

Claim 18 in the instant application stands rejected in view of Claim 12 in the '581 patent, while Claim 16 in the instant application stands rejected in view of Claims 53, 54 of the '581 patent.

GUNNISON, McKAY & HODGSON, L.L.P.
Garden West Office Plaza
1900 Garden Road, Suite 220
Monterey, CA 93940
(831) 655-0880
Fax (831) 655-0888

Claim 18 in the instant application depends from Claims 1, 16 and 17. Accordingly, Claim 18 includes all the limitations of Claims 1, 16, 17 and 18. Claim 12 in the '581 patent depends form Claims 1 and 12. Thus, Claim 12 includes all the limitations of Claims 1, 11 and 12. Below is a claim chart showing a comparison between Claims 18 and Claim 12.

Claim 12, `581 Patent	Claim 18 instant application
(Claim 1) receiving a first instruction defined for a first processor having a first base, said instruction comprising an operator and at least one operand having an operand type; converting said first instruction to a second instruction optimized for a second processor having a second base when overflow is not possible based at least in part on said operator and the relationship between said operand type and said second base, said second base smaller than said first base; and converting instructions in a chain of instructions to a wider base when said at least one operand carries the potential for overflow beyond said second base and when said operator is sensitive to	(Claim 1) **validating at least one input stack associated with a first instruction configured to operate on at least one operand of a first type, each of said at least one input stack associated with an input instruction of said first instruction, each input stack representing the state of an operand stack associated with an input instruction upon execution of said input instruction;** **optimizing said first instruction to a second instruction configured to operate on at least one operand of a second type, said second type smaller than said first type, said optimizing based at least in part on the relative size of said first type and said second type; and** **matching said second type**

GUNNISON, McKAY & HODGSON, L.L.P.
Garden West Office Plaza
1900 Garden Road, Suite 220
Monterey, CA 93940
(831) 655-0880
Fax (831) 655-0888

overflow, said chain bounded by said second instruction and a third instruction that is the source of potential overflow associated with said at least one operand, said third instruction having been previously optimized, said wider base larger than said second base and smaller or equal to said first base	**with an operand type of at least one operand in said at least one input stack associated with said second instruction, said matching comprising changing the type of instructions in a chain of instructions to equal said second type if said operand type is less than said second type, said chain bounded by said second instruction and a third instruction that is the source of said at least one operand**
(Claim 11) further comprising recording conversion results, said recording comprising: determining potential overflow associated with said second instruction; and generating an output stack based at least in part on execution of said second instruction	(Claim 16) further comprising recording conversion results, said recording comprising: determining potential overflow associated with said second instruction; and generating an output stack based at least in part on execution of said second instruction
	(Claim 17) **said determining further comprises:** **indicating said second instruction has potential overflow if said second type does not**

GUNNISON, McKAY & HODGSON, L.L.P.
Garden West Office Plaza
1900 Garden Road, Suite 220
Monterey, CA 93940
(831) 655-0880
Fax (831) 655-0888

	equal said first type, if said second instruction does not remove potential overflow, and if said second instruction creates potential overflow; and **indicating said second instruction has potential overflow if said second type does not equal said first type, if said second instruction does not remove potential overflow, if said second instruction does not create potential overflow, if said second instruction propagates potential overflow, and if at least one operand in said at least one input stack has potential overflow**
(Claim 12) said determining further comprises: indicating said second instruction has potential overflow if said second type does not equal said first type, if said second instruction does not remove potential	(Claim 18) said determining further comprises: indicating said second instruction has potential overflow if said second type does not equal said first type, if said second instruction does not remove potential

GUNNISON, McKAY & HODGSON, L.L.P.
Garden West Office Plaza
1900 Garden Road, Suite 220
Monterey, CA 93940
(831) 655-0880
Fax (831) 655-0888

overflow, and if overflow is possible based at least in part on the type of said second instruction and the relationship between said first type and said second type; and indicating said second instruction has potential overflow if said second type does not equal said first type, if said second instruction does not remove potential overflow, if overflow is not possible based at least in part on the type of said second instruction and the relationship between said first type and said second type, if said second instruction propagates potential overflow, and if at least one operand in said at least one input stack has potential overflow	overflow, and if overflow is possible based at least in part on the type of said second instruction and the relationship between said first type and said second type; and indicating said second instruction has potential overflow if said second type does not equal said first type, if said second instruction does not remove potential overflow, if overflow is not possible based at least in part on the type of said second instruction and the relationship between said first type and said second type, if said second instruction propagates potential overflow, and if at least one operand in said at least one input stack has potential overflow.

Applicants respectfully note that Claim 18, as shown by bold in the above claim chart, includes limitations that are neither suggested nor disclosed by Claim 12 in the '581 patent.

GUNNISON, McKAY & HODGSON, L.L.P.
Garden West Office Plaza
1900 Garden Road, Suite 220
Monterey, CA 93940
(831) 655-0880
Fax (831) 655-0888

The rejection extracts pieces of Claim 1 in the instant application and then argues that Claim 1 in the '581 patent suggests that piece. However, Claim 1 in the '581 patent fails to suggest validating, optimizing, and matching as recited in Claim 1. Further, the rejection failed to allege that Claim 12 suggests the further limitations of Claim 17. Moreover, only Applicants' claim language can be used and not any teaching from the disclosure. Similar comments are also applicable to each of Claims 37, 56 and 75. Applicants respectfully request reconsideration and withdrawal of the obviousness-type double patenting rejection of each of Claims 18, 37, 56 and 75.

Claim 16 in the instant application depends from Claim 1. Accordingly, Claim 16 includes all the limitations of Claims 1 and 16. Below is a claim chart showing a comparison between Claims 16 and Claim 53 of the '581 patent.

Claim 53, `581 Patent	Claim 16 instant application
A method of using an application software program including arithmetic expression optimization of at least one instruction targeted to a processor, the method comprising: receiving the software program on said processor, said software program optimized according to a method comprising: receiving a first instruction defined for a first processor having a first base, said	(Claim 1) A method for arithmetic expression optimization, comprising **validating at least one input stack associated with a first instruction configured to operate on at least one operand of a first type, each of said at least one input stack associated with an input instruction of said first instruction, each input stack representing the state of an operand stack**

GUNNISON, McKAY & HODGSON, L.L.P.
Garden West Office Plaza
1900 Garden Road, Suite 220
Monterey, CA 93940
(831) 655-0880
Fax (831) 655-0888

instruction comprising an operator and at least one operand having an operand type; converting said first instruction to a second instruction optimized for a second processor having a second base when overflow is not possible based at least in part on said operator and the relationship between said operand type and said second base, said second base smaller than said first base; and converting instructions in a chain of instructions to a wider base when said at least one operand carries the potential for overflow beyond said second base and when said operator is sensitive to overflow, said chain bounded by said second instruction and a third instruction that is the source of potential overflow associated with said at least one operand, said third	**associated with an input instruction upon execution of said input instruction;** **optimizing said first instruction to a second instruction configured to operate on at least one operand of a second type, said second type smaller than said first type, said optimizing based at least in part on the relative size of said first type and said second type; and** **matching said second type with an operand type of at least one operand in said at least one input stack associated with said second instruction, said matching comprising changing the type of instructions in a chain of instructions to equal said second type if said operand type is less than said second type, said chain bounded by said second instruction and a third instruction that is the source of said at**

GUNNISON, McKAY & HODGSON, L.L.P.
Garden West Office Plaza
1900 Garden Road, Suite 220
Monterey, CA 93940
(831) 655-0880
Fax (831) 655-0888

instruction having been previously optimized, said wider base larger than said second base and smaller or equal to said first base; and executing said at least one instruction on said processor.	**least one operand**
	(Claim 16) further comprising recording conversion results, said recording comprising: determining potential overflow associated with said second instruction; and generating an output stack based at least in part on execution of said second instruction

The above remarks with respect to Claim 1 in the instant application are incorporated herein by reference and are directly applicable to the comparison of Claim 1 with Claim 53. Claim 53 fails to teach or suggest anything with respect to validating. Claim 53 receives and then converts and requires characteristics of an operator. There is no suggestion or teaching of elimination of the operator characteristics as recited in Claim 1 of the instant application. Claim 54 includes limitations similar to those of Claim 53 and so the remarks with respect to Claim 53 are directly applicable to Claim 54. Similar comments are also applicable to each of Claims 35, 54 and 73. Applicants respectfully request

GUNNISON, McKAY & HODGSON, L.L.P.
Garden West Office Plaza
1900 Garden Road, Suite 220
Monterey, CA 93940
(831) 655-0880
Fax (831) 655-0888

reconsideration and withdrawal of the obviousness-type double patenting rejection of each of Claims 16, 35, 54 and 73.

Claims 1, 20, 39, 58, 77 and 78 stand objected to for reciting "source of said at least one operand." Applicants note that Claim 1 recites "a third instruction that is the source of said at least one operand." Applicants fail to understand the comments with respect to overflow, because the claim is directed at operations that are not associated with overflow considerations.

When the claim is read as a whole, the antecedent basis for "said at least one operand" is "an operand type of at least one operand in said at least one input stack. Therefore, the at least one operand is on the at least one input stack and the third instruction is the source of that at least one operand. The plain meaning of source is that the third instruction results in the placement of the at least one operand on the input stack and so is the source of that operand. This follows directly from the claim recitations and has nothing to do with overflow. Applicants respectfully request reconsideration and withdrawal of the objection to each of Claims 1, 20, 39, 58, 77, and 78.

Claims 1 to 78 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,740,441, hereinafter referred to as Yellin, in view of U.S. Patent No. 6,308,317, hereinafter referred to as Wilkinson.

Yellin is characterized in the rejection as teaching arithmetic expression optimization. Yellin is not directed at optimization, but rather verification. For example,

> The interpreter, prior to executing any bytecode program, executes a bytecode program verifier procedure that verifies the integrity of a specified program by identifying any bytecode instruction that would process data of the wrong type for such a bytecode and any bytecode instruction sequences in the specified program that would cause underflow or overflow of the operand stack. If the program verifier finds any instructions that

GUNNISON, McKAY & HODGSON, L.L.P.
Garden West Office Plaza
1900 Garden Road, Suite 220
Monterey, CA 93940
(831) 655-0880
Fax (831) 655-0888

> violate predefined stack usage and data type usage restrictions, execution of the program by the interpreter is prevented.

Yellin, Abstract.

Thus, Yellin does not do any optimization but instead simply verifies whether the data types for the bytecodes are correct and whether there is underflow or overflow of the operand stack. If any of these conditions are found, nothing is modified but instead execution of the program is prevented.

In particular, Yellin fails to suggest or disclose "optimizing a first instruction to a second instruction." Figs. 4C and 4D of Yellin are not directed at optimizing one instruction to another instruction but instead simply determining whether when an instruction pops data from the stack, a stack underflow occurs, and when an instruction pushes data on a stack, a stack overflow occurs. If an underflow does not occur, a determination is made whether data type for the stack and the instruction match for a pop.

There is no teaching of optimizing the instruction and it is not necessary, because as taught by Yellin if the desired conditions are not met, execution is simply prevented. Fig. 4A is an overview process diagram for the verification process while Fig. 4B is an overview of the operation 366 in Fig. 4A. The data flow analysis performed by Yellin fails to teach anything about how to optimize an instruction as recited in Claim 1, it simply verifies that the code will execute without stack overflow or underflow, and that each instruction operates on data of the correct type. If this is not true, the statements are not optimized but instead execution by the interpreter is prevented.

In particular, Claim 1 recites "a first instruction configured to operate on at least one operand of a first type." This instruction is optimized to "a second instruction configured to operate on at least one operand of a second

GUNNISON, McKAY & HODGSON, L.L.P.
Garden West Office Plaza
1900 Garden Road, Suite 220
Monterey, CA 93940
(831) 655-0880
Fax (831) 655-0888

type." Therefore, the second instruction is different from the first instruction because according to Claim 1, "said second type smaller than said first type." As noted, Yellin fails to teach that the verification results in any change to an instruction that operates on a different operand type.

Applicants note that a second reference was cited, but the second reference fails to correct the deficiencies of the primary reference and so the combination fails to render Claim 1 obvious. Applicants respectfully request reconsideration and withdrawal of the obviousness rejection of Claim 1.

Claims 2 to 19 depend from Claim 1 and so distinguish over the combination of references for at least the same reasons as Claim 1. Applicants request reconsideration and withdrawal of the obviousness rejection of each of Claims 2 to 19.

Claims 20, 39, 58, 77 and 78 each include limitations similar to those of Claim 1. Accordingly, the above remarks with respect to Claim 1 are applicable to each of these claims and are incorporated herein by reference. Applicants request reconsideration and withdrawal of the obviousness rejection of each of Claims 20, 39, 58, 77 and 78.

Claims 21 to 38 depend from Claim 20 and so distinguish over the combination of references for at least the same reasons as Claim 20. Applicants request reconsideration and withdrawal of the obviousness rejection of each of Claims 21 to 38.

Claims 40 to 57 depend from Claim 39 and so distinguish over the combination of references for at least the same reasons as Claim 39. Applicants request reconsideration and withdrawal of the obviousness rejection of each of Claims 40 to 57.

Claims 59 to 76 depend from Claim 58 and so distinguish over the combination of references for at least the same

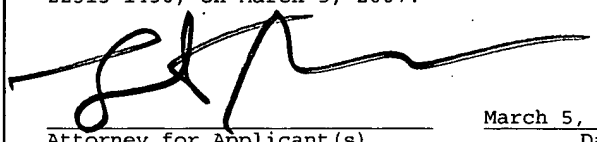
GUNNISON, McKAY & HODGSON, L.L.P.
Garden West Office Plaza
1900 Garden Road, Suite 220
Monterey, CA 93940
(831) 655-0880
Fax (831) 655-0888

reasons as Claim 58. Applicants request reconsideration and withdrawal of the obviousness rejection of each of Claims 59 to 76.

Claims 1 to 78 remain in the application. For the foregoing reasons, Applicant(s) respectfully request allowance of all pending claims. If the Examiner has any questions relating to the above, the Examiner is respectfully requested to telephone the undersigned Attorney for Applicant(s).

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on March 5, 2007.



Attorney for Applicant(s) of Signature

March 5, 2007
Date

Respectfully submitted,

Forrest Gunnison
Attorney for Applicant(s)
Reg. No. 32,899
Tel.: (831) 655-0880

GUNNISON, McKAY & HODGSON, L.L.P.
Garden West Office Plaza
1900 Garden Road, Suite 220
Monterey, CA 93940
(831) 655-0880
Fax (831) 655-0888